WHAT IS CLAIMED IS:

1. A process for manufacturing a semiconductor integrated circuit device, comprising the steps of:

(a) forming an insulating film over a first major surface of a wafer;

(b) forming a wiring groove in the insulating film by patterning the insulating film;

(c) forming a metal layer including copper as its principal component, over the insulating film and in the wiring groove;

(d) removing the metal layer outside the wiring groove by a chemical mechanical polishing method so as to leave the metal layer in the wiring groove, wherein the wafer is treated one wafer at a time;

(e) after step (d), transferring the wafer to a wafer storage portion, while keeping the first major surface of the wafer shaded such that an illuminance of the first major surface of the wafer is 100 lux or less;

(f) keeping the first major surface of the wafer wet with flowing water in the wafer storage portion, while keeping the first major surface of the wafer shaded such that an illuminance of the first major surface of the wafer is 100 lux or less;

(g) after step (f), performing scrub or brush cleaning to the first major surface of the wafer with a liquid chemical, while keeping the first major

surface of the wafer shaded such that an illuminance of the first major surface of the wafer is 100 lux or less, wherein the wafer is treated one wafer at a time; and then

(h) making the first major surface of the wafer dry, while keeping the first major surface of the wafer shaded such that an illuminance of the first major surface of the wafer is 100 lux or less.

2. A process for manufacturing a semiconductor integrated circuit device, comprising the steps of:

(a) forming an insulating film over a first major surface of a wafer;

(b) forming a wiring groove in the insulating film by patterning the insulating film;

(c) forming a metal layer including copper as its principal component, over the insulating film and in the wiring groove;

(d) removing the metal layer outside the wiring groove by a chemical mechanical polishing method so as to leave the metal layer in the wiring groove, wherein the wafer is treated one wafer at a time;

(e) after step (d), applying an anti-corrosion treatment to the first major surface of the wafer by rubbing the first major surface of the wafer with a polishing pad provided with an anti-corrosion liquid chemical;

(f) after step (e), transferring the wafer to a wafer storage portion,

while keeping the first major surface of the wafer shaded such that an illuminance of the first major surface of the wafer is 100 lux or less;

(g) keeping the first major surface of the wafer wet with flowing water in the wafer storage portion, while keeping the first major surface of the wafer shaded such that an illuminance of the first major surface of the wafer is 100 lux or less;

(h) after step (g), performing scrub or brush cleaning to the first major surface of the wafer with a liquid chemical, while keeping the first major surface of the wafer shaded such that an illuminance of the first major surface of the wafer is 100 lux or less, wherein the wafer is treated one wafer at a time; and then

(i) making the first major surface of the wafer dry, while keeping the first major surface of the wafer shaded such that an illuminance of the first major surface of the wafer is 100 lux or less.

3. A process for manufacturing a semiconductor integrated circuit device, comprising the steps of:

(a) forming an insulating film over a first major surface of a wafer;

(b) forming a wiring groove in the insulating film by patterning the insulating film;

(c) forming a metal layer including copper as its principal component,

over the insulating film and in the wiring groove;

(d) removing the metal layer outside the wiring groove by a chemical mechanical polishing method so as to leave the metal layer in the wiring groove, wherein the wafer is treated one wafer at a time;

(e) after step (d), performing pre-cleaning to the first major surface of the wafer by rubbing the first major surface of the wafer with a polishing pad provided with a liquid chemical or cleaning water;

(f) after step (e), transferring the wafer to a wafer storage portion, while keeping the first major surface of the wafer shaded such that an illuminance of the first major surface of the wafer is 100 lux or less;

(g) keeping the first major surface of the wafer wet with flowing water in the wafer storage portion, while keeping the first major surface of the wafer shaded such that an illuminance of the first major surface of the wafer is 100 lux or less;

(h) after step (g), performing scrub or brush cleaning to the first major surface of the wafer with a liquid chemical, while keeping the first major surface of the wafer shaded such that an illuminance of the first major surface of the wafer is 100 lux or less, wherein the wafer is treated one wafer at a time; and then

(i) making the first major surface of the wafer dry, while keeping the first major surface of the wafer shaded such that an illuminance of the first

major surface of the wafer is 500 lux or less.

4. A process for manufacturing a semiconductor integrated circuit device, comprising the steps of:

(a) forming an insulating film over a first major surface of a wafer having an N-type semiconductor region and a P-type semiconductor region;

(b) forming groove or hole patterns in the insulating film;

(c) forming a metal layer including copper as its principal component, over the first major surface of the wafer having the patterned insulating film;

(d) forming a plurality of metal patterns by removing the metal layer outside the groove or hole patterns so as to leave the metal layer in the groove or hole patterns, wherein the wafer is treated one wafer at a time;

(e) after step (d), transferring the wafer to a wafer storage portion, while keeping the first major surface of the wafer shaded such that an illuminance of the first major surface of the wafer is 100 lux or less;

(f) keeping the first major surface of the wafer wet with flowing water in the wafer storage portion, while keeping the first major surface of the wafer shaded such that an illuminance of the first major surface of the wafer is 100 lux or less;

(g) after step (f), performing scrub or brush cleaning to the first major surface of the wafer with a liquid chemical, while keeping the first major

surface of the wafer shaded such that an illuminance of the first major surface of the wafer is 100 lux or less, wherein the wafer is treated one wafer at a time; and then

(h) making the first major surface of the wafer dry, while keeping the first major surface of the wafer shaded such that an illuminance of the first major surface of the wafer is 100 lux or less.

5. A process for manufacturing a semiconductor integrated circuit device, comprising the steps of:

(a) forming an insulating film over a first major surface of the wafer;

(b) forming a wiring groove in the insulating film by patterning the insulating film;

(c) forming a metal layer including copper as its principal component, over the insulating film and in the wiring groove;

(d) removing the metal layer outside the wiring groove by a chemical mechanical polishing method so as to leave the metal layer in the wiring groove, wherein the wafer is treated one wafer at a time;

(e) after step (d), immersing the first major surface of the wafer in flowing water in a water container of a water immersing portion, while keeping the first major surface of the wafer shaded such that an illuminance of the first major surface of the wafer is 100 lux or less;

(f) after step (e), performing scrub or brush cleaning to the first major surface of the wafer in a post-cleaning portion, while keeping the first major surface of the wafer shaded such that an illuminance of the first major surface of the wafer is 100 lux or less, wherein the wafer is treated one wafer at a time; and then

(g) making the first major surface of the wafer dry, while keeping the first major surface of the wafer shaded such that an illuminance of the first major surface of the wafer is 100 lux or less.

6. A process for manufacturing a semiconductor integrated circuit device, comprising the steps of:

(a) forming an insulating film over a first major surface of a wafer;

(b) forming a wiring groove in the insulating film by patterning the insulating film;

(c) forming a metal layer including copper as its principal component, over the insulating film and in the wiring groove;

(d) removing the metal layer outside the wiring groove by a chemical mechanical polishing method so as to leave the metal layer in the wiring groove, wherein the wafer is treated one wafer at a time;

(e) after step (d), continuously passing the wafer to perform scrub or brush cleaning to the first major surface of the wafer with a liquid chemical,

while keeping the first major surface of the wafer shaded such that an illuminance of the first major surface of the wafer is 100 lux or less, wherein the wafer is treated one wafer at a time; and then

(f) making the first major surface of the wafer dry, while keeping the first major surface of the wafer shaded such that an illuminance of the first major surface of the wafer is 100 lux or less.